

broad central greenish-yellow wavy band, and having a greenish-yellow spot on the apex and shoulder of each elytron partly covered with fine erect distinct black hairs. Under side of body greenish yellow, pubescent. Legs black, with greenish yellow undersides to femora and tibiæ. Tarsi greenish yellow above.

Length $\frac{5}{10}$ to $\frac{6}{10}$ inch.

Habitat North of China.

In the collection of the British Museum.

This pretty species varies considerably in the nature of its markings, being sometimes without the yellow green spots near the shoulder, and sometimes with the spots produced into a narrow transverse wavy band.

XVII. Notes on the Habits of Various Insects. By Mr. WILLIAM VARNEY.

[Read 2nd August, 1852.]

Sting of Bee.—HÜBER says, that “the sting by which this little animal defends itself is composed of three parts, the sheath and two darts. The sheath, which has a sharp point, makes the first impression. The sheath sometimes sticks so fast to the wound, that the insect is obliged to leave it behind; and to the bee itself the mutilation proves fatal.” The sheath, however, makes no impression, and I have never found it to enter or make a wound; it is large near the base, and gradually tapers to a point, and is quite smooth, and if it did make an incision the bee would be able to draw it back again without hurting itself. The barbs which do the mischief are very sharp; and when they penetrate, they hold fast to the wound like a fish-hook, and the bee is mostly unable to draw them out of the wound, always leaving the darts with the sheath; and it seems impossible to leave the sheath behind without the darts, as they are all rooted firmly together. I know not whether, when thus mutilated, they die, or whether they are killed or driven away by the other bees.

Moss-carder Humble Bees.—Respecting the humble bee, Réaumur says, that “the community, which numbers from 20 to 300, consists of females of two sizes—the very largest and the small ones; males, which are stingless; and neuters. It is

very probable that, alone and unattended, the female lays the foundation of the future little village. The nest is composed of a tuft of moss." On a sloping bank, near Hanwell Asylum, among the shrubs, I found one of these curious little nests; it consisted of a small lump of moss, one large bee, one cup filled with honey, and six small larvæ of the bee feeding upon a mass of pollen, of a darkish brown colour. I found another nest on the same bank, about ten yards distant, which was a little larger than the first—as large as a hen's egg; it consisted of a lump of moss, one large bee, one cup filled with honey, and six larvæ feeding upon a mass of bee bread; and six cocoons, spun by the full-grown grubs of the bee. Each nest was founded by a large bee, the largest of the class. I think the small ones are not females, but workers only.

Wasp-nests.—Réaumur says that "the material from which the common wasp's nest is constructed is vegetable fibre. As the first step in the process of paper-making is to soak the vegetable fibre in water, so the wasp takes as special care to select the filaments which it intends to use from wet wood, which has rotted in the rain." In the summer of 1850, I saw a great many common wasps gathering wood from a post which was quite dry; each load which the wasp carried away was quite wet. This lasted many days; and as I stood near, and paid attention, I could see how they acted. The wasp ran about the post a little, and as soon as it found a place suitable, it wetted the wood, then scraped a little bit together, and put it between its fore legs, then it scraped another bit and put it to the first, and so it went on, until it had got a load; it then worked it all together into a ball, took it between its mandibles, and flew away to its nest. I could see the wet upon the wood when the wasp had gone away. The wasp scrapes the wood very fine, which would all fly away in dry weather, if no fluid was used. The wasp, by wetting the wood, can gather a load with little trouble, and with no loss of labour.

Mason Wasps.—On the south side of a brick wall, at Hanwell, I found a mason wasp at work, building a cell with mortar, which it finished in about an hour. It went seven times to some water, which was about twenty yards from the wall; with each supply of water it made two loads of mortar, very near the wall; when the cell was finished, the wasp laid an egg, and filled the cell with living food. I then opened the cell, which contained eighteen larvæ; they were not all of the same size, but each one had sixteen legs. I put them back into the cell, and closed them up. Another time, I broke down part of a cell when it was finished,

but the wasp mended it again in a short time. Another time, I took away six caterpillars, and put them a short distance from the cell; the wasp found them, and put them back into the cell. Again, I took away the egg of the wasp, and when the cell was finished I opened it, and found another egg in place of the one which I had taken away. When the wasp brought a caterpillar to its cell, it held it in a straight line, under its belly, carrying one end between its jaws. The caterpillars appeared dead, and were packed very close in the cell. The wasp slept in the cell at night, with its head out, and when the cell was nearly full, it remained with more than half its body out. I touched it several times, but it would not quit the cell. I then put an ant to it, which it crushed with its jaws. It made six cells in a week, and made mortar in one place the whole time, and continued to get water in another place; when it was making mortar the ants disturbed it several times, which made it fly up sometimes; at other times it would move a little, but it refused to leave the spot. I have never found these wasps to make a hole in a solid brick or stone, but when they find a cavity with loose rubbish in it, they will clean it out. These wasps are much smaller than the common social wasps, and are known by having a large black ring round the middle of the abdomen. They build cells in the cavities of walls.

Wasps killing Flies.—The common wasps catch a great number of flies in the summer time; and when they find a spot well stocked with these insects they will go there a great many times, until it is exhausted. When a wasp catches a fly, it first cuts off its legs and wings; then bruises it into a mortar, and carries it away to the nest. Having caught a fly, I put a bit of string round the middle of it, and offered it to a wasp, which took hold of it, and cut off its wings and legs, as usual; then it took hold of it to carry it away, but finding it could not move it away, it pulled first one way, then the other; at last, it found out the string, which was very fine, and cut it off close to the fly, which it then carried away.

Honey Bees.—I have observed that the honey bees gather honey from some flowers whilst they never touch others. They are very fond of the mignonette, but I have never seen the humble bees touch it. I have seen a great number of wild bees upon the snapdragon, the fox-glove, the everlasting peas, and the nasturtium, which the hive bees never touch. Both the hive bees and the wild bees are very partial to the Canterbury bells, from the cups of which they gather a great deal of pollen and honey.

The scent of the blossoms of the Scabions is very much like honey; and upon this flower I have seen a great number of insects. At one time I saw a mason bee, several humble bees, various kinds of butterflies, some other flies, and several hive bees, upon the flowers of this plant.

Bees fond of Water.—Réaumur, Hüber, and many other naturalists, have paid great attention to, and tried many experiments with the hive bees, but I do not find them to say any thing about water. I find these little creatures make use of a great deal of this fluid. In the summer time, in very dry weather, they may be seen drinking water between stones, and round about water-taps, and such like shallow places, immediately returning to the hive. They thus continued to get water every day in dry weather. I think they use it to moisten and prepare the wax: or perhaps they drink some of it, which remains to be ascertained.

Leaf-cutter Bees.—In the fine warm weather, having observed a rose-leaf-cutting bee cut a piece of leaf from the rose-tree, and carry it away and settle upon a wall, and go into a cavity where it was building its nest, repeatedly performing the same operation, I watched it more carefully, and observed that when it settled, it would examine two or three leaves before it found one to suit its purpose; it then settled upon a leaf, with its head towards the leaf stalk, and cut a piece out, which it did in a very short time. It held on to that part of the leaf which it was cutting out, and when it had cut it out it fell down, like a stone, for a short distance, before it took wing. When it had cut out the leaf it was not prepared for flight, and it always fell down like a stone before it took wing. One time, it fell on the ground with its load. It fell down several times among the leaves of the tree, and it found some difficulty in getting out with its load, which it held in a kind of half circle under its belly. I made a tube of bark, and put it in the wall; it was about six inches long, and about one-third of an inch in diameter. This was found in a few days by a rose-leaf cutting bee, in which it constructed a nest of rose-leaves. I split the tube before I put it in the wall, so that it could be opened without damaging the cells. When it was finished, I took it out of the wall, and found it contained eight cells, which were fitted together like thimbles. The tube was not full, it would have held several more cells; but the entrance was blocked up with several pieces of leaf, which prevented any other insect from entering the nest. In cutting a leaf, it sometimes makes a mistake, and when it has cut it about half through, it will suddenly leave it and go to another, but this does not often occur.

Transformation of Caterpillars.—I have seen many of the caterpillars of the common butterfly in the act of fixing the threads over their backs, the average number being about twenty-six ; some pass as many as thirty over their backs, and some only twenty-four. Every time it carries a thread over its back it glues it to the others which have been passed over its back before, which are all glued together into one thread ; it then withdraws its head, assumes a straight line, and waits to cast its skin and become a pupa. Some of them cast their skins at the end of three days, some at the end of six days, and some not till the end of the tenth day, when they become pupæ, from which the butterfly makes its escape in the following spring.

Winter Midge.—Contrary to the assertion of a writer, I find a remarkable difference between the male and the female of the winter midge ; the male has a slender body and fine feather-like antennæ ; the female has a short body, and such small antennæ, that it is difficult to perceive them with the naked eye. The swarms of these beautiful little creatures which are seen sporting in the air in such multitudes, in the winter evenings in mild weather in sheltered situations, are composed of males and females. As they sport together in the air they choose partners ; and while they struggle together they fall to the ground, where they become united, and remain together about ten minutes, when they separate, and fly away. There is another winter midge, found about the same time, in similar situations, which sports in the air in the same manner, and in large clusters ; the male and female fall down upon the ground, and remain together about the same time as the above. I have found the pupæ of these flies among very rotten rabbit manure. I kept a few of them in a box, which in a few days produced flies exactly like, in shape, size, and colour, to those which I caught sporting in the air. These flies are a great deal larger than the ones above-mentioned ; in fact, they are a little larger than the common gnat, but destitute of that long tube in front of its head, which denotes the bloodthirsty gnat.

Caterpillars of Bryophila perla.—On old walls, which are exposed to the weather, I have found a great many caterpillars, which feed upon the fine particles of a silver colour which grow upon such places. They make their cocoons in the holes of the wall, weaving a web over the hole ; then they bite off bits of stone, brick, mortar, or moss, and fix it to the webbing, so that it is difficult to find them out in some places, as the cocoon so nearly resembles the wall, brick, or mortar, to which it joins. They are found in the winter months, and when the weather is mild they

bite a hole through their cocoons, and come out and feed ; then they return back to their cells, and put out their excrement ; then they close up the hole, which makes it complete. They do not travel more than four or five inches, or at most a foot, from the cell, as they find food close at hand. They generally return to the cell which they had occupied before ; but when several of them are feeding near together, they sometimes go into the wrong ones ; and some of them cannot find their own cells, and are obliged to wander about till they can find a place to build a new one. They feed in the morning, and return to their cells about nine or ten o'clock, which I have witnessed many times. This morning, Thursday, 5th February, 1852, I saw a great many of them feeding upon a brick wall ; and I saw three of them go back to their own cells and eject their excrement ; then they closed up the entrance as neat as though it had never been opened. In cold weather they remain in their cocoons three or four days ; and in very sharp weather, as many as nine or ten days, or even more, without food ; but as soon as the weather becomes mild, they feel the change, and break through the cell, and feed as fresh as ever. I put one in the wall, in a small cavity, and put a piece of glass over it to see how it would begin its cell ; and I saw it carry several threads over the hole. It then bit off several bits of moss, and pushed them between the threads, until it became quite thick, and I could not see it any longer, as the caterpillar was inside the cell. The cells are quite smooth inside. These larvæ are about half or three-quarters of an inch long when they are full-grown, and are marked with blue and yellow stripes across the body. They change to a pupa, from which the fly makes its escape in about three weeks, in May. The eggs of these flies are a long while before they produce caterpillars, as the latter do not appear before the latter end of November, or the beginning of December, when the weather is damp and cold ; and although they are very small, they seek for a small cavity, in which they construct themselves a nest. They are provided each with sixteen legs ; some are of deeper blue than others, and most of them are marked with blue on each side, a yellow line along the back, and a few small brown spots.

Blow Flies.—Speaking of the species of blow-flies which produce lively larvæ instead of eggs, Réaumur observed, that “there is no danger of the maggots being destroyed in the midst of the putrifying mass, which might have been the case had eggs been placed there.” When these flies find a piece of meat, or a dead carcase, they search about and find an opening, in which they

deposit their eggs, and always put them as near to the centre as they can; and as soon as the maggots are developed, they eat their way to the interior, where they find the most food. There is no fear of the eggs being killed in the middle of the dead carcase. The flies put their eggs as far as they can into the meat or carcase, where they find moisture, which hastens their development. The eggs are not to be seen on the exterior part of a dead carcase, or on the outer part of a piece of meat of any kind; but the flies take care to put them in the hollow and moist places, where they soon hatch; and if you open the mouths of any dead animals, you may find the eggs in large quantities. When they deposit their eggs on a living sheep, they are close on the skin, where it is moist.

XVIII. *Contributions towards the Natural History of British Microlepidoptera.* By J. W. DOUGLAS, Esq.—
(Continued from page 81.)

[Read 6th December, 1852.]

Genus LITHOCOLLETIS, Zeller. (Pl. XIII.)

THE perfect insects of this genus may be known at a glance by the slenderness of their structure, the smallness of the thorax, and the characteristic markings of the anterior wings. These latter are fine lines on the apical half of the wing, sloping from either margin towards the apex, frequently meeting on the disk, and forming angles more or less acute. The general similarity of many species has caused great difficulty in recognising their distinctive characters; but though by practice they become more easy to separate, yet the most satisfactory mode of determining them is to rear them from the caterpillar state. Zeller has observed (*Linnaea Entomologica*, i. 169), that on account of the cilia of the anterior wings being coloured and scaled like the wings themselves, the true form of the latter is only to be seen on the under side.

The larvæ have but fourteen feet, the fourth ventral pair being absent; the whole body is flattened, the head small, and the three thoracic segments generally much widened; this last fact being the more remarkable when contrasted with the narrow